

CLAIMS

1. A protein which is capable of binding to  $\alpha_2$ M and which comprises the amino acid sequence of SEQ ID No 1 or a functional variant thereof.
2. A protein according to claim 1 comprising the amino acid sequence of SEQ ID No 2 or a functional variant thereof.
3. A protein according to claim 1 or claim 2 further comprising one or more tandem repeats having the amino acid sequence of SEQ ID No 3 or a variant thereof.
4. A protein according to any one of claims 1, 2 or 3 further comprising a cell membrane anchor region together with a hydrophobic transmembrane region.
5. A protein according to any preceding claim consisting of the amino acid sequence of any of SEQ ID Nos 1 to 11 or a variant thereof.
6. A peptide comprising a fragment of at least 6 amino acids in length of the protein of claim 5.
7. A peptide according to claim 6 comprising a fragment of at least 20 amino acids of the protein of claim 5.
8. A peptide according to claim 6 or 7 which is capable of generating an immune response against group A streptococcus.
9. A peptide according to claim 6 or 7 which binds  $\alpha_2$ M.
10. A peptide according to claim 6 or 7 comprising the acid sequence of SEQ ID NO: 3 or a variant of the said sequence.
11. A peptide according to claim 10 comprising two or more repeats of the amino acid sequence of SEQ ID NO: 3 or of a variant of the said sequence.
12. A protein or peptide which is capable of generating a protective immune response to group A streptococcus which comprises:
  - (i) the amino acid sequence of SEQ ID No. 1
  - (ii) a functional of (i)
  - (iii) a functional fragment of at least 6 amino acids in length of (i) or (ii).
13. A DNA sequence which codes for a protein or peptide according to any preceding claim, said DNA sequence being selected from:
  - (a) the DNA sequence of any of SEQ ID Nos 12 to 16 or the

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complementary strands thereof;

(b) DNA sequences which selectively hybridize the DNA sequences defined in (a) or fragments thereof; and

(c) DNA sequences which, but for the degeneracy of the genetic code, would hybridize to the DNA sequences defined in (a) or (b) and which sequences code for a protein or peptide having the same amino acid sequence.

5 14. An expression vector comprising a DNA sequence according to claim 13 operably linked to a regulatory sequence.

10 15. A host cell transformed with the DNA sequence of claim 13.

16. A host cell according to claim 15 transformed with the expression vector of claim 14.

15 17. A process of producing a protein or peptide according to any of claims 1 to 12, comprising culturing a host cell as defined in claim 15 or 16 under conditions to provide for expression of the desired protein or peptide.

18. A vaccine composition comprising a protein or peptide according to claim 12 and a pharmaceutically acceptable carrier.

19. A protein or peptide according to any one of claims 1 to 12 for use in generating a protective immune response in an individual to group A streptococcus.

20 20. A method of immunising an individual against a group A streptococcus comprising administering a protein or peptide according to claim 12 to the individual.

21. An antibody capable of binding to a peptide or protein according to any one of claims 1 to 12.

25 22. A method of treating an individual with a GAS infection comprising administering an antibody according to claim 21 to said individual.